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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,630	06/28/2001	Seigi Aoyama	3008-28	4486
20457	7590	11/30/2004	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			DINH, TUAN T	
			ART UNIT	PAPER NUMBER
			2841	

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/892,630

Applicant(s)

AOYAMA ET AL.

Examiner

Tuan T Dinh

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2,4,5,7 and 14-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17 is/are allowed.
- 6) ☒ Claim(s) 2,4,7,14-16 and 18-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

The request filed on 09/09/04 for a Request for Continued Examination (RCE) under 37 CFR 1.114 based on parent Application No. 09/892,630 is acceptable and a RCE has been established. An action on the RCE follows.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 2, 15-16, and 20, 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Hasegawa et al. (U.S. Patent 6,475,643)

Regarding claims 2, 15-16, 20, and 22, Hasegawa discloses a lead free solder alloy (see an abstract) comprising:

an alloy composition containing: 0.002-0.015% by mass of phosphorus (P= 0.001-0.1 % weight, see column 3, lines 36-37) with the balance consisting of tin (column 3, line 37), wherein bismuth (Bi) and antimony are not added to the alloy composition.

Regarding claims 20, 22, Hasegawa discloses the alloy composition excluded bismuth and antimony, see table in page 5, example 9.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4-5, 7, and 21 rejected under 35 U.S.C. 103(a) as being unpatentable over Kenji et al (hereafter PA, figures 1 and 2 submitted by applicant) in view of Hasegawa et al. (U.S. Patent 6,475,643).

Kenji discloses a connection lead as shown in figures 1-2 comprising:  
a copper strip (1) or other strip conductor; and  
a plating (2a, 2b) provide on at least one side of the strip conductor, said plating being formed of a lead-free solder composed mainly of tin, and has a shape such that the plating in a widthwise direction of the strip conductor having a bulge formed of an arc, a triangle, or stairs as viewed in section with an apex being located at a proper position in the widthwise direction of the strip conductor.

Kenji does not show said plating containing 0.002 to 0.015% by mass of phosphorus, 2.0-5.0% by mass of silver, 0.01-2.0% by mass of copper, with the balance consisting of tin excluding bismuth.

Hasegawa teaches an alloy composition containing 0.002 to 0.015% by mass of phosphorus, and balance of tin, the alloy excluding bismuth and an antimony.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have teaching's Hasegawa employed in the connection lead of PA for the purpose of improving thermal fatigue characteristic of a solder alloy.

5. Claims 14, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. ('643) in view of Matsuzaki (JP-03255637) as in the record, hereafter JP.

Hasegawa et al. does not disclose the alloy further containing 2-5% by mass of silver and 0.01-2% by mass of copper. JP discloses the solder in the abstract the alloy composition further containing: 2.0 to 5.0% by mass of silver (Ag-0.5-6.0% by mass) and 0.01 to 2.0% by mass of copper (Cu-1.0% by mass).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the teaching of JP employed in the alloy composition of Hasegawa for the purpose of providing a thermal and electrical conductivity connection.

6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kenji et al. (hereafter PA, figures 1 and 2 submitted by applicant) Hasegawa ('643), and further in view of JP-03255637 A, as in the record.

Kenji et al. and Hasegawa et al. do not disclose the alloy further containing 2-5% by mass of silver and 0.01-2% by mass of copper. JP discloses the solder in the

abstract the alloy composition further containing: 2.0 to 5.0% by mass of silver (Ag-0.5-6.0% by mass) and 0.01 to 2.0% by mass of copper (Cu-1.0% by mass).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the teaching of JP employed in the alloy composition of Kenji and Hasegawa for the purpose of providing a thermal and electrical conductivity connection.

***Allowable Subject Matter***

7. Claim 17 is allowed.

The following is an examiner's statement of reasons for allowance: the references cited do not teach or suggest an alloy composition **consisting of** 0.002-0.015% by mass of phosphorus (P); 2.0-5.0% by mass of silver (Ag); 0.01-2.0% by mass of copper (Cu); and tin.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Arguments***

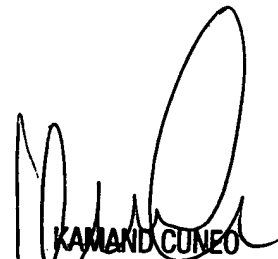
Applicant's arguments with respect to claims 2, 4-5, 7, and 14-22 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kammie Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan Dinh  
November 16, 2004.

  
**KAMMIE CUNEO**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**